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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,355	08/13/2001	Igor Shvets	1817-0113P	4598
2292	7590	12/29/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			NAGPAUL, JYOTI	
			ART UNIT	PAPER NUMBER
			1743	

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,355

Applicant(s)

SHVETS ET AL.

Examiner

Jyoti Nagpaul

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-170 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19, 22-26, 28-43, 46-66, 69-96, 98-116, 119-138, 141-165 and 168-170 is/are rejected.
- 7) ☒ Claim(s) 20, 21, 27, 44, 45, 67, 68, 97, 117, 118, 139, 140, 166 and 167 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>08/13/2001</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

It is suggested by the examiner to make the following corrections to the following claims:

Claims 143 and 170, Line 1: "A divider barrier as claimed in...." to --A dispensing assembly as claimed in...--

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1-8, 11-17,22-24,28-41,46-58,81,83-87,92,110-114,119-125,130-133,136,141-161,168 and 169** are rejected under 35 U.S.C. 103(a) as being unpatentable over Coffee (US 6595208) in view of Tisone (6063339).

Coffee discloses a dispensing device. The dispensing device discloses a dispenser body having main bore (32a). A nozzle is mounted on the dispenser body and terminating in a dispensing tip (33). The nozzle has a nozzle bore (41) with a nozzle entrance communicating with the main bore. The main bore includes a divided barrier (57) for separating system and sample liquid within the assembly. The divided barrier (57) comprises of a body of elastomeric substantially incompressible material. (Col. 9, Lines 31-33) The dispensing device further includes an electrode electrically coupled to the dispensing tip and a separate receiving electrode remote from the tip. The assembly includes a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field. (See figure 2) The assembly includes a separate receiving electrode (60) positioned below the tip. The divider barrier comprises of two closely contacting members. (See Figure 4)

With regards to **Claims 1,110,131 and 154**, Coffee fails to disclose a positive displacement pump for delivery of metered quantities of system liquid through the assembly. However, Coffee does teach a reservoir containing a metered quantity of liquid.

Tisone discloses a dispensing apparatus. The dispensing apparatus includes a positive displacement pump for regulating the quantity or flow rate of liquid. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Coffee to replace the reservoir with a positive displacement pump of Tisone to displace the barrier to deliver sample liquid through the nozzle bore in order to increase the precision of quantity of sample liquid dispensed.

With regards to **Claims 6-8,34-35,51-52,88,123-125,146-148, and 157-161**, Coffee does not specifically disclose means for activating the receiving electrodes separately and droplet receiving substrate mounted above the receiving electrode. However, Coffee does disclose a microprocessor capable to determine the exact value and timings of the various voltages and other known forms of voltage ramping arrangements may be used. (Col. 5, Lines 4-15) Thus, it would have been clear to one of ordinary skill that the microprocessor is capable of activating the receiving electrodes separately. To arrange the receiving substrate below the electrode and other voltage ramping arrangements would have been obvious for ease of transfer from the receiving electrode.

With respect to **Claims 11,36,53,89-91,126,149, and 154**, Coffee fails to disclose positive displacement pumps installed in parallel. However, Tisone teaches positive displacement pumps installed in parallel to allow flow rate of reagent to be controlled independent of the particular flow characteristics of the liquid being dispensed. (Col. 6, Lines 66-68; Col. 7 Lines 1-5) Therefore, it would have been obvious to one having

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ordinary skill in the art at the time the invention was made to modify the apparatus of Coffee to include positive displacement pumps in parallel in order to regulate the quantity or flow rate of liquid provided to the dispensing head.

With respect to **Claims 12-14,30,46, 54,83-85,119-120,128,141-142, and 168**, Coffee fails to disclose a plurality of nozzles. However, Tisone discloses a plurality of nozzles in order to increase higher "dot" densities without significantly increasing production time or operating costs. (Col. 7, Lines 39-42) (See Figure 2) It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Coffee to include plurality of nozzles in order to increase efficiency and high throughput analysis of the system.

5. **Claim 1-19,22-26,28- 43,46-66,69-96,98-116,119-135,137-138,141-165, and 168-170** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray (US 6041801) in view of Coffee further in view of Tisone.

Gray discloses a fluid management system. The system includes a dispenser body (11); a nozzle (22,23) mounted on the dispenser body and terminating in a dispensing tip, the nozzle has a nozzle bore with a nozzle entrance communicating with the main bore. The system further includes a divided barrier (12) for separating system and sample liquid within the assembly. The divided barrier comprises of elastomeric substantially incompressible material.

Gray fails to disclose a positive displacement pump for delivery of metered quantities of system liquid through the assembly to displace the barrier. However, Coffee discloses a dispensing device with a positive displacement pump for delivery of

metered quantities of system liquid through the assembly. (See Figure 6a) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Gray in order to increase the control of flow rate of the system liquid through the assembly to displace the barrier to deliver sample liquid through the nozzle bore.

With regards to **Claims 2-8,31-35,48-52,100-106 and 121-125,144-148,155-161**, Gray fails to disclose an electrode electrically coupled to the dispensing tip and high voltage generating means connected to at least on the electrodes to provide an electrostatic field therebetween. However, Coffee discloses a various arrangements of voltage ramping arrangements (Col. 5, Lines 14-15) and voltage generating means (20) connected to at least on the electrodes to provide an electrostatic field therebetween. (See Figure 6a) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Gray in order to increase precision of quantity of sample liquid dispensed.

With regards to **Claims 11-15,36-38,53-56,75-78,89-91,107-109,126-129,149-152**, Gray fails to teach positive displacement installed in parallel. However, Tisone teaches positive displacement pumps installed in parallel. (Col. 6, Lines 66-68) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Coffee to include positive displacement pumps in parallel in order to regulate the quantity or flow rate of liquid provided to the dispensing head.

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6. **Claims 9-10,19,25-26,42-43,60-66,69-74,82-88,115-116,137-138, and 162-165,** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray in view of Coffee as applied to claims above, and further in view of Sugahara (US 5508726).

Refer above for Gray and Coffee teachings.

With regards to **Claims 9-10,25,42,60-65,69-74,82-84,115,137, and 162-164,** Gray in view of Coffee fails to disclose a compression wave generator and a controller having means to actuate the generator to cause a wave in the sample liquid. However, Sugahara discloses a ink jet apparatus with a compression wave generator and a controller having means to actuate the generator to cause ink droplets to jet out of a nozzle which is connected to a ink chamber. (Col.1, Lines 64-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Gray such that the a compression wave generator and a controller having means to actuate the generator to cause a wave in the sample liquid as the positive displacement delivery of the sample liquid to the dispensing tip in order to assist in dispensing small droplets required by the assembly.

With regards to **Claim 19,26,43,66,85-88,116,138, and 165,** Gray in view of Coffee fails to disclose a piezoactuator and a controller. However, Sugahara discloses a ink jet apparatus utilizing a piezoelectric arrangement. (Col. 1, Lines 12-13) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Gray such that a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and a controller having means to operate the piezoactuator to cause the compression

wave in the sample liquid in order to assist in dispensing small droplets required by the assembly.

Allowable Subject Matter

7. **Claims 20-21,27,44-45,67-68,97,139-140, and 166-167** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regards to **Claims 20-21,27,44-45,67-68,139-140 and 166-167**, prior art does not teach, or fairly suggest a magnetostrictive actuator and a controller having means to operate the magnetostrictive actuator.

With regards to **Claim 97**, prior art does not teach, or fairly suggest a container that can collapse on displacement in the main bore to lie across and against the nozzle entrance.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jyoti Nagpaul whose telephone number is 571-272-1273. The examiner can normally be reached on Monday thru Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JN


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